graphic plates drawn under his superintendence by R. Mintern. Although not so finished in execution as those of the late Mr. Ford, or quite so clear in detail as what Franz Wagner has done for Dr. Peters in the same style, these plates form a great addition to the volume, and exhibit some of the special structures of the group in a very efficient way.

Of the general merits of the Zoological Catalogues of the British Museum, and of the credit due to the staff of the Zoological Department for their preparation in the face of many difficulties, we have spoken in a previous notice of one of this same series.[1] It is much to be regretted, however, that more pains are not taken to make the existence of these most valuable publications known to the world. No publisher's name being on the title-page, it is difficult for the general public to know how to procure them, and no information on the subject is given in the volumes themselves. So far as we know, they are not advertised in any way, and no copies are sent out for review—certainly not to the office of NATURE;[2] so that it is only by chance that one becomes aware of their issue. On the Continent there are many complaints about the difficulty of procuring copies, and naturalists in London receive frequent applications from their brethren abroad on this subject. This might be all remedied by putting a publisher's name on the title-page—a course adopted by all our principal scientific societies for their publications—or even by adding to each volume a list of the series, with some directions as to how and where they are to be obtained. Another mystery connected with these catalogues which we have never been able to understand is why the authors of them should not be allowed to write their own prefaces. In some of the older volumes even the author's name is not given on the title-page. This privilege has been conceded of late years, but the prefaces continue to be written by the "keeper of the department." We are told this is a "regulation of the trustees"—an answer given, we may observe, about many other rules and regulations at the British Museum, of which no one can understand the utility.

TIDY'S "HANDBOOK OF CHEMISTRY"

Handbook of Modern Chemistry, Inorganic and Organic, for the Use of Students. By Charles Meymott Tidy, M.B., F.C.S. (London: J. and A. Churchill.)

THIS work is divided, as is usually the case with chemical text-books, into three large divisions; the first containing the chemistry of non-metallic bodies, the second the chemistry of the metals, and the third the chemistry of organic substances.

In the first two chapters, preliminary to those discussing systematically the natural occurrence, preparation, and properties of the non-metals, the author describes the more general principles involved in the science, embracing such topics as nomenclature, atomic and molecular combination, combination by volume, atomicity and quantivalence, &c. The subjects here touched upon are clearly dealt with, and Mr. Tidy's style of writing cannot fail to attract the attention of the reader.

The subsequent portion of the book, consisting of Chapters III. to IX., embraces the consideration of the individual properties of the different non-metallic elements; and although this part of the work abounds in valuable and, as far as we can see, accurate information, there is an important point with regard to it upon which we cannot thoroughly congratulate the author; namely, the order in which he has arranged the non-metallic elements. He commences with oxygen and finishes with hydrogen. We cannot at this moment see, nor can we find any explanation in the preface or otherwise, stating why this particular order should be adopted; and we are inclined to think that, for the sake of instruction in chemical order and classification, it indicates a defective appreciation of the wants of the student. It appears to us that, keeping this point in view, the order of such a text-book as Mr. Tidy's should be that in which the elements forming the least complex compounds are first taken, then those which possess a larger number of compounds and of a more complicated nature.

This becomes evident if it be considered what the student is met by in reading this portion of the book, where, instead of first being made acquainted with the properties of hydrogen, the body now almost universally adopted as our standard of reference for the atomic weights of the elements, for the densities of gases, &c., he has to consider oxygen "a common and important substance, certainly," but not one which is now taken as our standard, or which forms the simplest combinations, so far as its own relations are concerned, with other bodies. The reader then passes, in the next chapter, to the consideration of the group of elements, consisting of fluorine, chlorine, bromine, and iodine; bodies having a simpler volume relation to hydrogen than oxygen has: and he is then introduced to a long series of compounds, the oxyacids of the halogen series, where three elements take part in the combination before he has become acquainted with compounds containing only two, such as hydrochloric acid or water. Nay, more, he has to consider acid bodies containing hydrogen—reads equation after equation in which the body water occurs as a product of decompositions, without his previously having learned anything either about the preparation and properties of hydrogen, or the composition of water.

Again, in the arrangement of the subjects treated of in the chapter dealing with the special consideration of hydrogen (Chap. IX.) we think there is room for improvement; and that it would be better to adopt an arrangement depending on the simplest volume relations of the substances, placing them in the series monatomic, diatomic, triatomic, and so on, instead of first taking water where the ratio of hydrogen to the other substance is 2 : 1, then the halogen compounds of hydrogen where the ratio is more simple, viz., 1 : 1, then its compounds with nitrogen, phosphorus, and arsenic, where the ratio is 3 : 1, then back again to sulphuretted hydrogen, where the ratio is 2 : 1, and finally, to the simple compound of carbon and hydrogen with the ratio 4 to 1. If the student is at all thoughtful, and has paid any attention to the sections on "combination by volume," &c., which we have already stated to be clearly written, he will find himself at the end of the consideration of the non-metals rather at a loss to form any idea of order or classification as regards chemical bodies.

[1] See our review of Sharpe's "Catalogue of Birds," NATURE, vol. xvi. p. 541.

[2] Since the above was in type a copy of Dobson's "Catalogue" has been sent us by the author.—ED.

In the next portion of the work, comprehending Chapters X. to XVIII., devoted to the description of the metals, Mr. Tidy has introduced some very useful tables, in which he gives, under the more important metals, lists of their salts, with the different acids, as well as the common and constitutional formulæ of the compound, and in many cases the molecular weight, specific gravity, and percentage of metal in the salt. This tabular form has not usually been systematically adopted in text-books, and has many advantages, more especially when the work is used for consultation.

In connection with this part, however, which embraces also the general consideration of acids, bases, and salts, it is to be regretted that the definition of an acid comes so late in the volume as p. 252; we should have expected to have found some description at least of an acid a little earlier. With respect also as to what "an acid is," the index of the work is misleading; thus, for instance, on consulting it with regard to the above point we are referred to p. 527, where we find the definition of an organic acid; the term acid in its ordinary sense being only found under the term salt. It may be urged that an acid is a salt of hydrogen, but it is rather too much to expect one who may be reading a chemical text-book for the first time to know all this, more especially as he meets with no explanation of the matter as far as we have found till p. 252.

The last part of the work, comprising Chapters XIX. to XXXI., is occupied with the consideration of the organic division of the science. We regret that space does not permit us to enter very fully into a review of this portion of the book, but as far as we can judge the information contained in it is accurate and well arranged. Here we are glad to see, as in the chapters describing the metals, tables giving the names, formulæ, specific gravities, boiling points, &c., of the different substances arranged in their respective groups or series. These tables we have no doubt will prove of very great use to the student. An appendix contains an account of the recent experiments of Pictet on the liquefaction of oxygen, &c., and a description of Mendeleeff's "Law of periodicity of the chemical elements." Great clearness in style is given to the book by the tables just referred to, and to the methodical manner in which Mr. Tidy has arranged the individual consideration of each element under several heads, as "(1) History, (2) Natural History, (3) Preparation, (4) Properties—(α) sensible, (β) physical, and (γ) chemical," and so on; but notwithstanding this arrangement, which adds to the value of the book, we regret the order in which the author has placed the non-metallic elements, which we cannot help regarding as defective in the case of a text-book designed for the use of students.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

On the Proposed Observatory on the Summit of Mount Etna

Two years ago (September 22, 1876) Prof. Tacchini, of Palermo, read a paper before the Accademia Gioenia of Catania "Sulla Convenienza ed utilità di erigere sull' Etna una Stazione Astronomico-Meteorologica" (NATURE, vol. xv. p. 262). He proposed herein that an observatory should be erected at the Casa Inglesi, which is situated at the foot of the cone of the great crater 9,652 feet above the sea. In it daily observations, both astronomical and meteorological, should be taken during six months of the year, and the telescope should then be removed to Catania and the observations continued.

No more has been heard of this scheme but we sincerely trust that it will not fall to the ground, and that, if need be, our own astronomers will come forward to promote so good a work. No one who has not witnessed a cloudless starlit sky on a perfectly calm night from an elevation of two miles, can realise the difference between it and the same sky seen from the surface of the earth. When I ascended Etna in August, 1877, I was particularly struck by the extraordinary brilliancy of the midnight sky. It was one blaze of brilliant light. Myriads of stars which I had never seen before were visible, and the whole sky was studded with stars of every magnitude, colour, and brightness. The meteors which flashed across the sky were too numerous to count, and the stars themselves shone with extraordinary scintillations. I specially noticed a curious effect for which it is not easy to account, viz., the apparent lowness of the sky. It appeared to be almost pressing down upon one's head, and the larger stars seemed to be suspended below the sky. A good telescope brought to bear upon such a sky would reap a harvest of results. Tacchini noticed that Venus cast shadows, and Sirius appeared to rival Venus.

The observatory on Etna should be constructed on the most sheltered side of the mountain. It might be placed a little to the west of the Torre del Filosofo, the traditional observatory of Empedokles. It could be built of lava collected on the spot, and it would not be difficult to sink the foundations to a depth sufficient to ensure steadiness. It should be telegraphically connected with the observatory at Catania, and barometric and thermometric readings should be taken at the same instant of time at the two stations. It should be provided with a good 8 or 10-inch refractor, the lenses of which could be transported to a duplicate mounting in the observatory of Catania during the winter months. Moreover, it should possess a complete set of self-registering seismological instruments similar to those employed by Palmieri, and now exhibited in the Paris exhibition. Good spectroscopes should be provided, and a set of instruments for magnetic observations.

We are quite confident that considerable results would accrue to many of the sciences if systematic observations were carried out under the proposed conditions which have never yet been attempted, and we trust that astronomers both at home and abroad will not allow the subject to fall to the ground.

G. F. RODWELL

Compound Lightning Flashes

IN NATURE, vol. xviii. p. 67, an instance is given of several flashes of lightning following in the same path, and information concerning similar observations is asked for.

In almost every tropical thunderstorm the phenomena may be seen; to best advantage when the storm is distant. Three, four, and even more discharges may take place, the second and remaining flashes following in rapid succession through the identical path taken by the first. The intervals between the flashes vary; one may follow another so rapidly as to seem merely like a bright pulsation in the first, or there may be an appreciable interval of darkness; but it is certain that, if the eye can be trusted, these secondary flashes follow the exact course of their primary. The reason of this may be looked for in the heating effect of the lightning. The partial vacuum caused by the first discharge offers a line of comparatively small resistance to succeeding currents.

The singular part of the phenomenon is the rapidity with which the electricity must form or collect to admit of several discharges taking place at the same spot, for I do not think the secondary flashes can be regarded as merely residual.

During a severe storm at Mangalore on the 28th of last April two military buildings were struck by lightning, and, from the numerous paths taken by the electricity through the buildings, in its passage to the earth from the points struck, I was led to think the damage might be the result of these *compound* flashes; for it was conceivable that the destruction caused by each discharge might increase the resistance of the path taken, leaving succeeding flashes to follow in fresh directions of